B U L L E T I N

of the

United States Institute for Textile Research, Inc.

Vol. II March, 1932 No. 3

C O N T E N T S

Luncheon-Reception to President Garvan

Order "Textile and Allied Research" Now

New Members Elected

Abstracts

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Secretary's Temporary Office
65 Franklin St., Boston, Mass.

T. R. I. BULLETIN

An Official Publication of
United States Institute for Textile Research, Inc.

Vol. II March, 1932. No. 3

LUNCHEON-RECEPTION TO PRESIDENT GARVAN

Presidents of Other Textile Associations Invited Guests at Hotel Biltmore, New York, N. Y., April 29th

The luncheon-reception to be tendered to President Garvan by the Board of Directors and members of U. S. Institute at the Biltmore Hotel, New York City, Friday, April 29th, promises to be the most important and interesting function in the history of the organization, and every member should reserve this date and plan to be present, pending receipt in the near future of program details. The committee having charge of arrangements as appointed at the meeting of the Executive Committee, March 17th, consists of H. V. R. Scheel, chairman, William W. Buffum, treasurer of The Chemical Foundation, of which Mr. Garvan is president, and the Secretary of U. S. Institute.

The Tentative Program

It is planned to start the luncheon at 12:30 P. M., and follow it with a speaking program which, other than the principal address by President Garvan, will be confined to brief talks by a number of the industry's leaders and men prominent in industrial research. As it is planned to adjourn about 2:00 P. M., New York members can participate in about the usual time taken for lunch, while members from outside of the city will have ample time before and after the function for business calls.

The presidents of leading textile associations will be invited guests of U. S. Institute. Among those who have already promised to attend and speak are Franklin W. Hobbs, chairman of The Textile Foundation and president of the National Association of Wool Manufacturers; George A. Sloan, president of the Cotton-Textile Institute, and Maurice Holland, director, division of engineering and industrial research of the National Research Council.

H. V. R. Scheel will preside at the luncheon, and President Garvan will be introduced by Dr. E. H. Killheffer. The regular quarterly meeting of the Board of Directors will be held at the same place as the luncheon-reception, convening at 10:30 A. M., and adjourning in ample time for a reception to the President prior to the luncheon.

Gives Services to Whole Industry

This luncheon-reception to President Garvan is much more than a private affair of U. S. Institute members, for in accepting the presidency of U. S. Institute Mr. Garvan is giving the whole textile industry the benefit of his great experience as an apostle and organizer of scientific research. The textile industry, and all other domestic industries dependent for their success upon the existence of an adequately developed chemical industry, had previously owed Mr. Garvan a permanent debt for his monumental work as Alien Property Custodian and as president of The Chemical Foundation in salvaging the domestic chemical industry from foreign monopoly. It is only fair, therefore, that representatives of all the leading textile associations should be accorded the opportunity of joining U. S. Institute members in honoring Mr. Garvan on the occasion of his formal introduction to the latter as their president, for as president of U. S. Institute he is giving his services free of cost to the whole industry for the further organization and promotion of scientific research.

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ORDER "TEXTILE AND ALLIED RESEARCH" NOW

Sufficient Advance Orders Will Make Possible Reduced Sales Price

At the meeting of the Executive Committee, March 17th, the Secretary of U. S. Institute was directed to assume the responsibility for merchandising the so-called annual, "Textile and Allied Research: A Review of Progress," and the sum of $300 was appropriated from U. S. Institute funds to defray necessary expenses of the sales campaign. Direct selling of the volume was decided upon for the purpose of making it available to members at the lowest possible price, and to net a reasonable profit on sales outside of the organization. It is hoped that the cost to members will not be over $2.50, plus postage and packing, for the volume of approximately 250 pages, and that the cost to outsiders may be held to $3. Within the next two weeks the last of the text should be received and edited and a final estimate of cost made possible. This will be published with a complete prospectus of the book in the next issue of T. R. I. Bulletin.

Your Advance Order Necessary

As this is the first time that a work of this kind has been offered to the industry there is no yardstick with which to estimate probable sales. As U. S. Institute lacks funds to finance publication of a stock of books in anticipation of possible sales, the first edition will not exceed that which can be financed by the $1,000 guarantee of Massachusetts Institute of Technology, which fund covers only the cost of the finished book--unless sales to members and others in advance of publication warrant an increase in the size of the initial edition with a consequent decrease in unit cost. For instance, if the first edition is no more than 500 copies the unit cost will be approximately 50 cents more than the unit cost of an edition of 1000 copies.

If advance sales to members and others prior to May 1, when the volume should be ready for the press, aggregate approximately 500 copies, U. S. Institute will be warranted in ordering an initial edition of 1000 copies and in making a price to members of not over $2.50 a copy. Like U. S. Institute itself the sales campaign for this book is a cooperative enterprise, and the Secretary must have the active cooperation of each member to ensure its success; and that success should save each member at least 50 cents a copy. Use the order blank published in the February issue of T. R. I. Bulletin, or that on the enclosed return post card.

Reader Appeal of Book

Advance orders for "Textile and Allied Research" already received from individuals, corporations and libraries indicate that there are several misconceptions as to its character:

(1) The belief that its appeal is solely to persons of scientific training engaged in textile research work.

Actually, nearly every chapter reviews recent textile research and interprets its practical application in simple language. An executive of one small textile mill who has ordered five copies believes he may need double that number to provide a copy for each of his key men who should have the book for reading and reference. It is not a "high-brow" publication, but brings to those of average technical knowledge the results and trends of scientific textile research.

(2) The belief that it is merely a review of textile research during the year 1931 is erroneous.

Being the first time that such a subject has been reviewed it has been found necessary by most of the contributors to review research progress for several years, and to that extent it is a compendium of existing scientific textile knowledge.

(3) The reference to the volume as a "so-called annual" is intentional.

Being the first attempt at the compilation of such a book the measure of its success is problematical. Certainly research progress in the textile industry during the current year will need to be much greater than it was in 1931 to warrant publication of this book on an annual basis, unless, perhaps, future volumes are to cover textile research progress throughout the world.

Primarily "Textile and Allied Research" is a piece of educational and promotional textile research literature that is designed to demonstrate the importance to the industry of scientific research and stimulate interest and co-operation therein. Its sponsors believe that there are thousands in the industry who could profit from its reading and they regret the lack of funds to give it the distribution it deserves.

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NEW MEMBERS ELECTED

The following new contributing and annual members of U. S.Institute have been elected:

Contributing:

Thayer P. Gates, Textile Specialist, New York City.
General Dyestuff Corp., New York City,
auth. rep., H. W. Martin, Sec.
Röhm & Haas Co., Inc., Philadelphia, Pa.,
auth. rep., S. C. Kelton, Sec.
Royce Chemical Co., Carlton Hill, N. J.
auth. rep., Albert J. Royce, Pres.

Annual:

Cluett, Peabody & Co., Inc., Troy, N. Y.,
auth. rep., Sanford L. Cluett, Vice-Pres.
Fulton Bag & Cotton Mills, Atlanta, Ga.,
auth. rep., Norman E. Elsas, Sec.
Mohawk Carpet Mills, Inc., Amsterdam, N. Y.,
auth. rep., E. Friderici.
Frank Stutz, Better Fabrics Testing Bureau, New York City.
Carl P. Waldinger, Treas., Chemical Mfg. Co., Ashland, Mass.

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ABSTRACTS

Note.- Abbreviations of titles of publications abstracted in this issue are identified as follows:

Am. W & C Rptr.	American Wool and Cotton Reporter
Ann. Appl. Biol.	Annals of Applied Biology
Ber. Deut. Chem. Ges.	Berichte der Deutschen Chemischen Gesellschaft
Can. J. Rsch.	Canadian Journal of Research
Cell'chem.	Cellulosechemie
Chem'ztg.	Chemikerzeitung
Chem. Abs.	Chemical Abstracts
Chem. W'blad.	Chemische Wocheblad
Chem. Zent'Blatt.	Chemisches Zentralblatt
Chim. et Ind.	Chimie et Industrie
Ind. Chim.	Industria Chimica
J. Am. Chem. Soc.	Journal of the American Chemical Society
J. Cell. Inst. (Tokyo)	Journal of the Cellulose Institute (Tokyo)
J. Chim. Phys.	Journal de Chimie Physique
J. Ind. & Eng. Chem.	Journal of Industrial and Engineering Chemistry
J. Op. Soc. Am.	Journal of the Optical Society of America
J. Phys. Chem.	Journal of Physical Chemistry
J. Prakt. Chem.	Journal of Praktikum Chemie
J. Rheo.	Journal of Rheology
J. Soc. Chem. Soc. (Japan)	Journal of the Society of Chemical Industry (Japan)
J. Soc. Dyers & Col.	Journal of the Society of Dyers and Colorists
J. T. I.	Journal of the Textile Institute
Rev. Gen. Mat. Plast.	Revue Generale des Matieres Plastiques
Tex. Am.	Textile American
Tex. Col.	Textile Colorist
Tex. Mfr.	Textile Manufacturer
Tex. Wld.	Textile World

SOLUBILITY OF CELLULOSE IN AMMONIA SALT SOLUTIONS.- Philip C. Scherer, Jr.
J. Amer. Chem. Soc., 53, 4009-13 (1931).

The solubility of cellulose in certain salt liquid ammonia solutions was studied. Ammonium thiocyanate, sodium nitrate, sodium iodide and sodium thiocyanate dissolved both regenerated and cotton cellulose; ammonium iodide dissolved regenerated cellulose only. Of the five salts tried, only NH_4CNS and NaCNS readily dissolved cellulose in the absence of moisture. $NaNo_3$ and NaI dissolved regenerated cellulose but not cotton cellulose if H_2O was present before adding NH_3. (Copied complete from Chem. Abs., 1932, 26,590.) (W)

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VISCOSE CELLULOSE: DETERMINATION.- H. Hawlik.
Chem. Abs., 1931, 25, 5018 (from Chem.-Ztg., 1930, 54, 755.)

One to 1.5g. of viscose is spread in a film, converted into xanthate with ammonium chloride solution and the xanthate changed into cellulose with 2% hydrochloric acid and washed with water; 25 c.c. of water, 15 c.c. of potassium dichromate solution (90g. per 1.) and 25 c.c. of concentrated sulphuric acid are added, the mixture is heated for four minutes, cooled and titrated with Mohr's salt (159 g. per 1.). The method is sufficiently accurate for most purposes and requires about 30 minutes. (Copied complete from J. T. I. Abstract Section, Vol. 23-1, 1932.) (S)

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THE ACTION OF WATER ON CELLULOSE DERIVATIVES.- J. Duclaux and J. Barbiere.
J. Chim. Phys., 1931, 28, 313-5.

If small quantities of H_2O are added successively to an acetone solution of cellulose nitrate the viscosity decreases, passes through a minimum when the amount of H_2O is about 5%, and then increases again when coagulation occurs. This effect was attributed to the state of association of the H_2O: when the H_2O acted as a solvent it was in the form of simple molecules, but when as a coagulant, it was in the associated form. The plastifying action was ascribed to the OH group of the H_2O which react with the OH groups of the cellulose nitrates and acetates which are the absorbent parts of these compounds. The relation between the time of flow from a viscometer and the percentage of H_2O from 0 to 8 in an acetone-water series was expressible by the equation $t = aw^2 + b$. (Copied complete from Chem. Abs., 1932, 26, 591.) (W)

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CELLULOSE ACETATE: PLASTICISING.- N. Ishii.
J. Cell. Inst. (Tokyo), 1931, 7, 51.

In investigations of the effect of solid plasticiser on cellulose acetate films it was found that there is a point in the plasticiser content-elongation curve at which the plastic elongation increases suddenly. This point just coincides with the content of plasticiser (about 30%) at which visible crystals begin to appear on the surface of the film. When cellulose acetate films are swollen in ethyl alcohol containing various amounts of plasticiser, the distribution of the latter between the swollen film and the alcohol is in agreement with Henry's law. The plasticising efficiency of triacetin is examined by the distribution method. The efficiency of plasticisers increases with their viscosity, surface tension and affinity for cellulose acetate. The increase in plasticity is ascribed to the swelling of the cellulose acetate, resulting in increases in the spaces between the structural units, and to the inner lubricating effect of the plasticiser. (Copied complete from J. T. I. Abstract Section, 1932, Vol. 23-1.) (S)

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CELLULOSE ACETATE: VISCOSITY AND MOLECULAR WEIGHT.- R. Eisenschitz and B. Rabinowitsch.
Ber. Deut. Chem. Ges., 1931, 64, 2522-2529.

The determination of the molecular weights from the dependence of viscosity on concentration is discussed and it is pointed out that the general laws on which the calculation is based can only be applied to colloids when the latter behave as ideal dilute solutions in which the particles move independently of each other. Determinations of the effect of concentration on viscosity in the case of solutions of Cellite in acetone and other solvents are described and the results are shown graphically. The results of viscosity and elasticity modulus determinations on acetone solutions show that in the concentration region tested (0.5-20%) the particles do not move independently and therefore methods of determining the molecular weight, based on either viscosity or osmotic pressure data, are not applicable. (Copied complete from J. T. I. Abstract Section, 1932, Vol. 23-1.) (S)

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STRUCTURE AND FORMATION OF THE ACETONE-SOLUBLE CELLULOSE ACETATES.- S. Iwasaki.
J. Soc. Chem. Ind., Japan, 1931, Vol. 34, Suppl. binding, P. 9-10.

A study of the fractional precipitation of cellulose acetate solutions indicated the physicochemical properties of the fractions, such as viscosity, solubility and melting point, to be considerably different, whereas the acid contents were about the same. These results suggested not only a theory of the mechanism of the ripening of cellulose acetate solutions, but also an explanation of several known but hitherto imperfectly understood phenomena relative to the structure of the acetone-soluble cellulose acetates. This theory is based on the micellar theory of Meyer and Mark that cellulose is composed of a bundle of long chains of glucose residues bound together through principle valences. In an example where the acid is not too strong, the principle valence chains will split into glucose bodies of different lengths. When the acid can penetrate only between the micelles and on their surfaces but not into the individual chains, which is known to be the case in the formation of hydrocellulose through the use of acid, micelles of different lengths are separated transversely (Form I); on the other hand, when the acid can penetrate into the micelles and onto the surface of the chain, which is the case with the normal ageing of cellulose acetate, the assumption is made that the space intervals of the chains are enlarged through acetylation and that loosely bound micelles result which are little altered in length, since variously placed chains, split at the principal valences, can form beside one another (Form 2). The cellulose acetate of form I is less soluble, whereas that of form 2 has a low viscosity and forms a strong film. (Copied complete from Chem. Abs., 1932, Vol. 26, P. 297.) (W)

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BREAKING AND BURSTING STRENGTHS OF SOME WEIGHTED AND UNWEIGHTED SILK FABRICS AFTER EXPOSURE TO LIGHT.- Marion E. Griffith.
Ohio Expt. Station, Bimonthly Bulletin, 1931, 151, 145-8.

A comparison of the effect of the violet carbon arc (Fadeometer) on the breaking and bursting strengths of some pure dye and weighted silk fabrics showed that in all cases there is less change in the strength of the unweighted than in that of the weighted silks. The change in bursting and breaking strengths is very similar in both weighted and unweighted silks after six hours exposure, but they show a greater difference after a longer exposure. There is less change in bursting than in breaking strength of both weighted and unweighted silks. (Copied complete from Chem. Abs., 1932, 26, 310.) (W)

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CELLULOSE ACETATE: SAPONOFICATION AND SOLUBILITY.- A. Deripasko.
Cell'chem., 1931, 12, 254-263.

Two cellulose acetate preparations were used for the tests. Acetate I was obtained by acetylation of cotton paper for seven hours at 25° C. in the presence of 15% sulphuric acid as catalyst and contained 55% acetic acid and 4% sulphuric acid; acetate II was prepared by acetylation for five hours at 30° C. with 7½% sulphuric acid as catalyst and contained 61-61.5% acetic acid and 1-1.2% sulphuric acid. A mixture of water and acetic acid was used for converting the primary acetate into the secondary acetone-soluble acetate by the so-called saponification process. During this process it was found in the case of acetate I that the sulphuric acid content of the acetate decreased, whilst the acetic acid content at first increased, reaching a maximum after a few hours. The maximum appeared to be higher the greater the excess of acetic anhydride pressure in the reaction mixture and at times reached 60% or over. The increase was not accounted for by simple replacement of sulpho groups. The stability of the product was found to depend partially on its sulphuric acid content. The viscosity of the acetone solution increased with the addition of greater amounts of water to the saponification mixture. The change of the viscosity with the duration of the process was linear; with 95% acetic acid the curve rose to a maximum and then fell again. With acetate II, the saponification process reduced the acetic acid content of the acetate to 57.6-56.4%. The effect of the concentration of the mixture on the viscosity of acetone solutions was similar to that observed with acetate I. Only acetates with acetic acid contents between 60% and 49% were soluble in acetone. A series of acetates with acetic acid contents varying from 60% to 57.5% and sulphuric acid contents from 0.1% to 0.3% was prepared. Only acetates containing 57.4-57.8% were soluble in ethyl acetate. Acetates containing 57% acetic acid were often found to be soluble in both acetone and chloroform. Acetone solutions were titrated with non-solvents and the amount for the production of turbidity was determined. This amount decreased with decreasing acetic acid content of the cellulose acetate for all the non-solvents tested except water, in which case an increase was observed. The differences in solubility observed between cellulose acetates of the same acetic content appeared to be due to differences in the sulphuric acid contents. (Copied complete from J. T. I. Abstract Section, 1932, Vol. 23-1, P. 59.) (S)

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CELLULOSE SOLS: ANISTROPY DUE TO FLOW.- J. M. Preston.
Nature, 1931, 128, 796-797.

Cellulose sols in cuprammonium hydroxide solution show appreciable double refraction when flowing, thus indicating that they contain non-spherical particles which are capable of being oriented by flow. Ageing in the presence of air reduces the double refraction, indicating a reduction in particle size. This is to be expected since the viscosity of such sols falls on exposure to air, and this fall of viscosity is considered to be due to a decrease in micelle size. (Copied complete from the J. T. I. Abstract Section, 1932, Vol. 23-1.) (S)

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INDIGO ON WOOL.- H. Jackson.
Tex. Mfr., 1931, 57, 371-372.

The evaluation of indigo products and the estimation of the amount of indigo on woolen goods, by extracting a 25-gram sample with glacial acetic and toluene, or pyridine, in a Soxhlet apparatus, are described. Qualitative tests for indigo on wool also are given. (Copied complete from Chem. Abs., 1932, 26, 309.) (W)

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WOOL MEASUREMENT TECHNIQUE.- Robert H. Burns.
Record of Proceedings, American Society of Animal Production, Annual Meeting 1929.

The paper covers work done at the Wyoming Experimental Station and discusses the measurement of the following dimensions of wool fibres: Length of staple; length of fibre or length of individual fibres with crimp removed; crimps per unit length, length of crimp, or percentage of crimp; strength, or breaking load; elasticity or extensibility under stress; diameter; density, number of fibres per unit area of skin, or specific gravity; scales and luster; structure and kemp. A review of the literature has been made and it is stated that a list of literature is available upon request. Particular reference is made to a German book 'Wollkunde' by Frolich, Spottel and Tanzer which is stated by the author to be in his opinion the best single book on the subject. (S)

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WOOL SHRINKAGE DETERMINATION BY MEANS OF SMALL SAMPLES.- Robert H. Burns.
Record of Proceedings, American Society of Animal Production, Annual Meeting 1930.

The paper covering work at the Wyoming Experimental Station covers a review of the literature, methods of experimentation, method of scouring, experimental data, and discussion of results. The conclusions are as follows: Small samples, taking representative handfuls from fifty fleeces, make satisfactory samples for shrinkage tests as far as can be determined by correspondence of duplicate samples; these samples should always be taken in duplicate; the expectancy is that the duplicate samples will very less than two per cent in shrinkage; larger differences in shrinkage between duplicate samples were associated with larger differences in commercial grading between the duplicate samples; there was no definite association of larger dirt differences between duplicate and larger shrinkage differences. (S)

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DETECTION OF ACETYLATED FIBRES.- D. Krueger and E. Tschirch.
Dyestuffs, 1931, Vol. 32, P. 91-97.

A review of the methods of detecting cellulose acetate, particularly by the reactions of acetic acid, with a bibliography. Acetic acid may be detected in a sample of supposed cellulose acetate by saponifying in 20 cc. H20 and 30 cc. N NaOH by heating for an hour at 50° to 60° C. The solution is neutralized to litmus paper with N or 0.5 N HCl, and rendered alkaline by a drop of NaOH solution. The solution is filtered, washed well with hot H_2O, and the filtrate and washings are evaporated to dryness. The dried filtrate is extracted three times by grinding with 2 cc. of absolute alcohol. The combined alcohol extracts are evaporated to dryness on a water bath. The residue may be treated in two ways: (1) Dissolve in 2 cc. H_2O and add 1 cc. of 5% $Na(NO_3)_3$ solution, 1 cc. of 0.02 N iodine solution, and 0.2 cc. of N NH_4OH. A bluish red or blue color indicates acetates. (2) The residue is taken up with about 0.3 cc. H_2O, a drop dried on a microscopic slide over the flame, cooled, and a drop of uranyl formate solution added. Examination at 200-300 powers shows tetrahedrous of sodium uranyl acetate. The uranyl formate solution is prepared by dissolving 1 g. of the salt in 8 cc. of H_2O, adding 1 cc. of formic acid, and filtering. It should be protected from sunlight. (Copied complete from Chem. Abs., 1932, 26, 298.) (W)

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THE AMINO ACIDS AND THEIR IMPORTANCE IN THE CHEMISTRY OF WOOL AND SILK.- Chas. E. Mullin and Howard L. Hunter.
Tex. Col., 1931, 53, 673-8, 706.

The structure, classification, and reactions of the 33 known amino acids are discussed, as well as their relation to other aliphatic acids. A bibliography of 49 references is given. (Copied complete from Chem. Abs., 1932, 26, 310.) (W)

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IMPROVEMENT IN TEXTILE FINISHING PROCESSES.- A. F. Kertess.
J. Soc. Dyers & Col., Jan., 1932, Vol. XLVIII, P. 7-9.

This article is a summary of a lecture describing the development and uses of the alkyl sulfates like Gardinol. The sulphonated oils like Turkey-red oil are sulphuric acid esters, stable in dilute solutions of metallic salts though not in lime solutions, but do not have the emulsifying and wetting-out power of soaps so cannot replace the latter in many instances. Improvements in sulphonation have produced true sulphonic acids of the various vegetable and animal oils, but the scouring value of these products is not great though their calcium salts are soluble in water. Condensation of several molecules of ricinoleic acid have produced products like Monopol Soap which are stable in acid and alkali but are not equal to soap for scouring purposes. The modified carboxyl group in sulphonated oils was found to be the cause of instability of these products in lime and acid solutions. Accordingly esterifying this carboxyl group before sulphonation and then sulphonating produced Avirole AH extra, the sodium salt of the sulphuric ester of butyl-ricinoleic ester, $C_{17}H_{32}SO_4NaCOOC_4H_9$. This product resists precipitation but has small scouring or wetting-out power. Humectol C is also like the Aviroles in properties though in this substance, the carboxyl group was modified into an amide group instead of an ester. Instead of fatty acids, the corresponding alcohols such as cetyl alcohol were treated with sulphuric acid, forming alkyl sulphuric acids, the sodium salts of which are known as Gardinols and Brilliant Aviroles. These substances possess all the properties of the ordinary soaps in addition to stability in acid, alkaline, and lime solutions and possess excellent wetting-out and emulsifying properties. These materials are manufactured by high pressure hydrogenation of natural fats with hydrogen at 100 atm. pressure, 300° C, in presence of carbonate of copper or nickel. Comparative scouring trials of Gardinols and soap are discussed, and the various uses of Gardinol in scouring, wet finishing, dyeing, etc. (D)

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ELECTROMAGNETIC QUARTZ FIBRE MICRO-BALANCE: CONSTRUCTION AND APPLICATION.- E. Wiesenberger.
Microchemie, 1931, New Ser., 4,10-26.

The construction of an electromagnetic quartz fibre micro-balance capable of weighing quantities down to 0.005-0.01 y and its application to the determination of very small quantities of metals as sulphates are described. A method of determining very small quantities of copper, depending on electrolysis of the solution in specially-designed apparatus and weighing of the deposit by means of the electromagnetic micro-balance, is also described. (Copied complete from J. T. I. Abstract Section, 1932, Vol. 23-1.) (S)

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THE SYSTEM: CELLULOSE - SODIUM HYDROXIDE - WATER.- Darch Van der Want.
Chem. W'blad., 1931, 28, 507-10.

With the help of a new method, in which an inert material such as sodium chloride or iodide is introduced into the system, the solid and liquid phases separated, and the total quantity of inactive material in the solid phase and also the percentage in the liquid phase are determined, the following preliminary conclusions are reached: Cellulose combines with sodium hydroxide and with water. The quantity of combined NaOH increases and the quantity of combined H_2OH concentration. The combination is solely by absorption. (W)

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MILDEW GROWTH ON ACETATE-SILK FABRICS.- John Eccles.
Tex. Mfr., 1931, Vol. 57, 184.

Aspergillus, Penicillium, Mucor, Fusarium, and Alternia types of mold were found on acetate-silk garments. (Copied complete from Chem. Abs., 1932, 26, 310.) (W)

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SPINNING QUALITY OF COTTON.- H. H. Willis.
Am. W & C Rptr., March 17, 1932, Vol. XLVI-11, P. 14, 21-22.
Tex. Wld., Mar. 19, 1932, Vol. LXXXI-12, P. 28-29.

A report of the raw cotton committee of Committee D-13 of the American Society for Testing Materials. Chairman Willis holds that raw cotton research to be of value should be based upon known varieties upon which a thorough check has been made from the growing season through the ginning season. "Test cottons are not comparable unless grown, harvested, ginned and manufactured under like conditions. It is the only way in which variables may be reduced to a minimum, since differences in weather, in soil and in ginning conditions have considerable influence upon spinning quality." (C)

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THE SACO-LOWELL SLIVER TESTER.
The Saco-Lowell Bulletin, Vol. 5-3, Mar., 1932, P. 1-12.

An autographic machine, driven by a constant speed motor, primarily designed for sliver, but equipped for testing roving up to 1.50 hank, operating on principle employed by E. D. Walen at Cotton Research Co. in 1925, but refined for practical mill and laboratory use by E. E. Blake, chief engineer of Saco-Lowell Shops. The sliver or roving is passed between a pair of rollers, the botton roller being positively driven at a constant speed and having a square groove into which the top roller fits exactly. The latter revolves on a shaft fixed in a lever arm that is pivoted at the end near the top roll, and that multiplies the motion of the top roll as it rises and falls with the thick and thin places. The lever arm is weighted approximately 1600 lbs. per sq. inch for sliver and 2500 lbs. per sq. inch for roving, the thickness of the sliver or roving under uniform compression being recorded as transmitted through the lever arm and a train of gears and rack to a pen arm carrying a capillary pen. The pen rises or falls 1/10th of an inch for every 1/1000 of an inch moved by the top roller. Two speeds are provided for the paper chart allowing the variations in the sliver to be recorded yard by yard, or reduced to three inches for every yard. (C)

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AUTOMATIC VISCOMETER.- J.Kuttner.
Instruments, 1931, 4, 519-520.

The instrument consists essentially of an ordinary pressure gauge measuring the head set up by oil flowing through a friction tube at a rate held constant by a diaphragm and ball check arranged somewhat as in an ordinary reducing valve. The seating of the ball valve is controlled by a point on the diaphragm button, while oil can flow between the ball and its seat into the space above the diaphragm. The latter has a small calibrated hole through which oil can pass underneath the diaphragm and from there to the calibrated outlet tube. The space between the diaphragm and the outlet is connected to the pressure gauge whose readings measure the true viscosity with a degree of precision considerably higher than that called for by practical conditions when testing engine lubricating oils. (Copied complete from J. T. I. Abstract Section, 1932, Vol. 23-1.) (S)

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THE PARTICULAR CHARACTERS OF THE PRINCIPLE VEGETABLE TEXTILE FIBRES.- A. J. Sauri.
Chim. et Ind., 1931, 8, 204-207; cf. Chem. Abs., 25, 4408.

The characteristic microscopical, chemical and physical properties of the following fibres are described: Cotton, aloes, hemp, flax, nettle, ramie, yucca, jute and New Zealand flax (Phormium tenax), also the preparation of fibres for microscopic examination. A mixture of white gelatin 60, water 100, glucose 50 and camphor 1.5 is recommended as an embedding medium for preparing sections of fibres. (Copied complete from Chem. Abs., 1932, 26, 310.) (W)

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ASPERGILLUS NIGER: IMPORTANCE OF ZINC FOR.- M. Roberg.
Chem. Zent'blatt., 1931, II, 1306-1307 (from Zentr. Bakter. Parasitenk., 1931, II, Abt. 84, 196-230.)

Almost complete removal of iron, zinc, and copper from weakly alkaline nutrient solutions can be effected by shaking with charcoal. Details are given. A weakly alkaline nutrient solution may be freed from iron, copper and zinc by simply boiling and filtering. Zinc in small amounts acts as a nutrient for Aspergillus niger. Increases in concentration stimulate vegative growth. With insufficient iron content, however, a delay in conidial fructification is observed. In solutions containing large amounts of zinc the conidia acquire a yellowish-brown or dark brown colour. If the zinc content is increased further, only a poisoning effect is observed. The smaller the amount of iron present, the earlier does the checking action of the zinc appear. The minimum amounts of zinc required for growth have been determined for seven different strains of Aspergillus. The form in which the zinc is added is not important. Zinc sulphate, valerate, acetate and lactate, zinc oxide and metallic zinc are effective. The age of the conidia used was, within the limits of two days to sixteen months, without influence on the development of the fungus and the effect of metal salts. (Copied complete from J. T. I. Abstract Section, Vol. 23-1, 1932.) (S)

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THE COLOR CURVE: ITS APPLICATION TO THE DEFINITION OF COLOR, ITS FASTNESS, LUMINOSITY AND PURITY.- R. Toussaint.
Bull. Ann. Assoc. Chim. Ind. Text. 1930, 67-68; Chim. et Ind., 1931, 26, 409.

An explanation is given of the determination of these characteristics by means of the T. C. B. photocolorimeter (see chemical abstracts 21, 3492). (Copied complete from Chem. Abs., 1932, 26, 309.) (W)

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LABORATORY METHODS OF DETERMINING WETTING POWER.- Beyer.
Bull. Ann. Assoc. Chim. Ind. Text., 1930, 64-66; Chim. et Inc., 1931, 26, 409.

B. measures the time required for immersion of the material to be wetted by carefully placing, with tweezers, a round piece of the fabric on the surface of the wetting liquid and noting with a stop-watch the time required for complete immersion. The tests are generally carried out at 20 degrees and are repeated 10 times and averaged.

The concentration, composition, and pH value of the bath have considerable influence on the results. (Copied complete from Chem. Abs., 1932, 26, 311.) (W)

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STUDIES ON CELLULOSE DERIVATIRES.- Gen. Itsu Kita.
Proc. World Eng. Congr., Tokyo, 1929, 31, 523-7 (1929).

A repetition of Cross and Bevan's experiment on the action of carbon bisulfide on alkali cellulose led to different results and the conclusions: A combination of $C_6H_{10}O_5$: CS_2: NaOH in the ratio 1:1:1 does not occur; in the regeneration of cellulose by the spontaneous decomposition the stage of combination of $C_6H_{10}O_5$:CS_2: NaOH = 4:1:1 does not always occur; the combination content of CS_2 or NaOH in normal xanthogenates is less than 0.5 mol. for 1 mol. of $C_6H_{10}O_5$; the polymerization of cellulose does not occur during the ripening process. Since it was observed that the spontaneous decomposition of the xanthogenate during ripening was stopped by the addition of either NaOH or CS_2, the cause of the decomposition was ascribed to a reaction between NaOH and Cs_2 furnished by the viscose, to form Na_2CS_3 and Na_2CO_3. (S)

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CELLULOSE: MOISTURE ABSORPTION.- S. Oguri and S. Terui.
Chem. Abs., 1931, 25, 5285 (from J. Soc. Chem. Ind., Japan, Suppl.'31,34,182.)

The sorption of water by standard cellulose was measured by means of a spring balance and sorption isotherms were obtained for temperatures between 12° and 28°. Then the various isotherms are plotted against relative humidity, the curves converge into one. (Copied from J. T. I. Abstract Section, 1932, 23-1.)(S)

BIBLIOGRAPHY

ONE-BATH METHOD MINIMIZES SHADE VARIATIONS IN DYEING SILK HOSIERY.- W.H. Lorimer.
Tex. Wld., Mar. 12, 1932, P. 31.

In dyeing silk hosiery containing yarns of both high and soft twist the one-bath method has been found preferable, due to the fact, the writer states, that the alkalinity of the bath retards the rate of absorption of the dyestuff and at the same time enables the color to penetrate more readily in those places where the knitting is tight, or in those parts knit with high twist yarns. It has been found essential that the goods be properly boiled off before dyeing, that the dyestuff be strained and added to the bath slowly, and that only colors that exhaust slowly should be used. (C)

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A NEW CELLULOSIC RAW MATERIAL: YUCCA, A EUROPEAN COTTON.- Kurt Roos.
Rev. Gen. Mat. Plast., 1931, Vol. 7, P. 391-403, 451-455.

A review of the work done in Germany on the possibilities of yucca as a substitute for cotton. (Copied complete from Chem. Abs., 1932, Vol. 26, P. 295.) (W)

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COTTON OR PAPER FOR NITRATION.- C. Stark.
Plastics, Oct., 1931, 7: 549, 573.

At the present time the purification of cotton has been so improved that it is equal to cotton paper for nitration. It can now be purchased on the basis of a definite color, copper number, viscosity and fibre length. (Copied complete from Eastman Kodak Bulletin, Jan., 1932.) (S)

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TECHNOLOGY OF CELLULOSE ACETATE.- Dr. Aladin.
Plastics, Vol. 8-1, Jan., 1932, P. 15-17.

Continuing a concise but comprehensive scientific review of the world's patents on Cellulose Acetate issued during the past ten years, the present is concerned with acetylation. (S)

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GENERAL FORMULA FOR THE COMPUTATION OF COLORIMETRIC PURITY.- D. B. Judd.
J. Op. Soc. Am., Nov., 1931, 21: 729-47.

A formula for the computation of colorimetric purity is derived and five special cases illustrating its application are worked out. (Copied complete from Eastman Kodak Bulletin, Jan. 1932.) (S)

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LOWERING THE VISCOEITY OF CELLULOSE DERIVATIVES.- A. Bresser.
Ind. Chim., 1931, Vol. 6, P. 993-994.

A review, noting a few patents. (Copied complete from Chem. Abs., Vol. 26, P. 297, 1932). (W)

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PRINCIPLES OF RESEARCH LABORATORY MANAGEMENT.- G. W. Thompson.
J. Ind. & Eng. Chem., Jan., 1932, Vol. 24-1, P. 68-71.

An article concerned with personnel organization; records organization; organization with reference to field covered; methods of handling research problems; laboratory planning; and organization of finances. (S)

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A GENERAL REVIEW OF THE MICROBIOLOGY OF CELLULOSE AND ITS ASSOCIATED COMPOUNDS.- H. J. Bunker.

(Copied complete from Chem. Abs., 1932, Vol. 26, P. 162.) (W)

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IMPROVED MACHINE DESIGNED TO GIVE BETTER PENETRATION OF DYESTUFFS.- Winn W. Chase.
Tex. Wld., Jan. 23, 1932, P. 26-27.

Describes two new types of jigs designed to give improved penetration and maximum color value with certain of the vat and napthol colors as compared with conventional types of jigs and padders. One is fitted with submerged squeeze rolls and the other has both squeeze and draw rollers submerged. (C)

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COTTON FABRICS SUITABLE FOR HOOKED RUG FOUNDATIONS.- Ellen K. Beavens and John T. Wiginton.
Tex. Wld., Feb. 20, 1932, P. 16-17.

Construction of cotton substitute for burlap foundations commonly used for hooked rugs, and of various types of cotton fillers. (C)

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THE STRUGGLE AGAINST SPEED LIMITATIONS OF COTTON TRAVELER.- J. L. Truslow.
Tex. Wld., Feb. 20, 1932, P. 28-29.

Abstract of paper read at Forum of National Association of Cotton Manufacturers, Dec.10, 1931. Ring diameter and yarn number are important factors in determining theoretical traveler speed and wear of traveler. Advances opinion that nowhere in world today is there any idea regarding spinning that is going to change basic principles radically. (C)

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RECENT DEVELOPMENTS FORETELL MARKED CHANGES IN SILK THROWING.- Geo. W. Searell.
Tex. Wld., Feb. 6, 1932, P. 132.

Trend toward mechanical silk-soaking indicated, and need emphasized of scientific research on silk soaking oils and their utilization. Recent improvements in silk throwing equipment also referred to. (C)

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MILL MEN AND CHEMISTS DEVELOP BETTER RAYON YARNS AND FABRICS.
Tex. Wld., Feb. 6, 1932, P. 136-37.

Reviews recent advance in production of rayons of improved appearance and handle, and in rayon yarn and fabric processing, but notes little progress in improving properties of synthetic fibres, particularly tensile strength and elasticity. Deplores debasement of rayon products by weighting. (C)

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DEPRESSION CONTINUES TO STIMULATE IMPROVEMENT IN MACHINERY.
Tex. Wld., Feb. 6, 1932, P. 142-145.

Review of textile machinery innovations during 1931 discloses no changes in basic principles--chiefly improvements in design and attachments making possible better control and higher speeds. Among the major developments is a German compound-drafting frame capable of spinning cotton yarn direct from the drawing frame with drafts up to 400, and full-fashioned hosiery machines knitting legs and feet in one operation. A list of new physical and chemical testing equipment is included. (C)

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RULE-OF-THUMB METHODS DOOMED BY STEADY PROGRESS IN PROCESSING COTTON, WOOL AND SILK.
Tex. Wld., Feb. 6, 1932, P. 148-150.

A review of progress during 1931 in chemical processing of textile fibres, yarns and fabrics, also including a list of some of the major problems awaiting solution by scientific methods. (C)

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THE WEAVING OF HIGH-SET PLAIN WEAVE CLOTHS.- J. W. Pennington.
Tex. Am., Feb., 1932, P. 10-11.

Setting and timing of the loom to reduce to a minimum friction and breakage of warp threads due to abnormal number of ends of fine count interlacing with the filling every pick. (C)

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TODAY MOST TEXTILE "SECRETS" ARE UNDISCOVERED KNOWLEDGE.- Charles H. Clark.
Tex. Wld., Mar. 19, 1932, P. 26-27-29.

Paper presented before Committee D-13 of the American Society for Testing Materials, March 10. Nearly all of the great textile inventions have been the result of empirical methods, and most of few important machines and processes that had their origin in scientific research were the work of non-textile men. Because scientific research has been so little utilized thus far its possibilities for the development of new textile knowledge, that may be made the basis of new products and new uses for existing products, are greater than in many modern industries that are the product of scientific research and that regard it as a necessary and routine part of their business. The paper contains much historical data regarding the principal textile inventors and inventions, and also notes possibilities of current research and suggests several problems needing solution.

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MACHINE CONDITIONING OF FABRICS.
Am. W & C Rptr., Feb. 18, 1932, P. 9-10.

The importance of control of the correct moisture content of textile fabrics during finishing processes is emphasized and explained, as are the defects and troubles that result from lack of attention to this factor. Also explains the theory and operation of the Sjöström conditioning and cooling machine for producing and controlling a normal or pre-determined moisture content in fabrics during and following the finishing processes. (C)

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AUTOMATIC LOOM AT SHEFFIELD SCHOOL.
Am. W & C Rptr., Mar. 24, 1932, P. 55.

A Northrop automatic loom, installed by the Draper Corp. in the Mason laboratory of Sheffield Scientific School, New Haven, Conn., is used in connection with a scientific study of the human problems of technological progress conducted by the Yale Institute of Human Relations, the automatic loom having been selected as a typical example of such progress. (C)

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THE PURIFICATION OF CELLULOSE.- James F. Monaghan.
Am. W & C Rptr., Mar. 17, 1932, P. 15-18.

Purification of cotton is held to be a textile problem whether used for yarns and fabrics, or as cellulose for smokeless powder, photographic film or rayon. Its bleaching and prior processing should be in accordance with best textile practice. The writer favors the lime and ash boil and anti-chloring with sulphurus acid, explaining advantages of this procedure. (Reprint from Army Ordnance.) (C)

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TEXTILE FABRICS AND ULTRA-VIOLET LIGHT.- J. Eccles.
Tex. Am., Jan., 1932, P. 20-21.

Refutes claim that beneficial effect of ultra-violet rays of sunlight could be fully enjoyed if fabrics of cellulose acetate are worn, the differences between the transparencies of the various textile materials in the violet and ultra-violet regions of the spectrum being of little moment as regards utilization of ultra-violet radiation from sunshine. Also shows that, for insulation against ultra-violet light from arc and mercury vapor lamps, the values of fabrics depend almost entirely upon their construction, the nature of the textile materials being of minor importance. (C)

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THE PROCESSING AND PROBLEMS OF SEWING AND KNITTING YARNS.- William Bennett.
Tex. Am., Feb., 1932, P. 49-51, 62.

Bleaching, dyeing and other finishing processes designed to retain initial evenness and tensile strength of yarns as far as possible, to avoid uneven dyeing and other defects commonly incident to these processes. A practical rather than a theoretical treatise. (C)

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